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**REMARKS**

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons which follow.

**Claim Rejections - 35 U.S.C. § 103**

In section 2 of the Office Action, the Examiner rejected claims 1-4, 6-19, 22 and 24-27 under 35 U.S.C. 103(a) as being unpatentable over Chen (U.S. Patent No. 5,982,092) in view of Umemoto et al. (U.S. Patent No. 6,366,409 B1). The Examiner stated:

Regarding claims 1-4, 6-9, 17-19, 22 and 24-27, Chen (U.S. Patent No. 5,982,092) discloses a lighting system for a display (Figure 3) comprising:

- a light source 40 providing light having wavelength in a spectrum not visible to the human eyes (Figure 3, column 1, lines 10-14, and column 3, lines 10-14);
- a reflective layer 50- also considered herewith as a light converter - having a fluorescent surface reflecting the invisible light from the light source 40, and converting the invisible light into visible light to human eyes (Figure 3, column 3, lines 5-7 and 11-20);
- the light source 3 including a light guide 10 (Figure 3, column 2, line 54);
- the reflective layer 50 inherently provided with metallized coating well known in the art;
- the light source including a light emitting diode (LED) 40 (Figure 3, column 3, lines 11-13);
- the light emitting diode 40 emitting ultraviolet light (Figure 3, column 1, lines 9-12, and column 3, lines 34-38)

Chen further teaches that the light source disclosed by him, and comprising the above-indicated feature, could be utilized as a light source for a liquid crystal display (LCD) (Figure 1 and

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abstract). However, Chen does not teach specific features and position of a LCD as recited in claims 1, 3 and 4.

On the other hand, Umemoto et al. (U.S. Patent No. 6,366,409 B1) discloses a planar light source 11 (Figures 3 and 4) with a display layer 3 (Figure 3, column 15, lines 5-7) inherently having its pixels altered with an application of electric charge. In addition, Umemoto teaches alternate positions - below or above - the planar light source 11 (Figures 3 and 4) respective to the display layer 3.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine lighting system of Chen with the display layer - LCD - and its positioning as taught by Umemoto providing for the benefits and advantage of providing a display system with a lighting system having long operational life, energy efficiency and steady illumination.

Regarding claims 10-15, Chen (U.S. Patent No. 5,982,092) discloses a light source 40 (LED) emitting light in visible to the human eyes, a reflective layer 50 having a fluorescent surface reflecting the invisible light, and converting it to the light visible to the human eye.

Chen further teaches a reflective layer 50 inherently having a metallized surface; and the light source 40 providing ultraviolet (UV) light.

Umemoto et al. (U.S. Patent No. 6,366,409 B1) discloses a liquid crystal display (LCD) 3 with display layer inherently having its pixels.

Neither in combination nor individually Chen (U.S. Patent No. 5,982,092) and Umemoto et al. (U.S. Patent No. 6,366,409 B1) teaches a light source 40 providing infrared (IR) light, use of LEDs emitting infrared light for the display system. It would have been obvious to one of ordinary skill in the art at the time of the invention to make use of LEDs emitting IR light instead of UV light emitting diodes, since its use for a display system is known in the art.

Regarding Claim 16, it has been held that a recitation with respect to the manner in which a claim apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitation.

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Finally, it would have been obvious to one of ordinary skill in the art at the time of the invention to make use of the teachings Chen and Umemoto for meeting the method limitations of Claims 10-16.

In section 3 of the Office Action, the Examiner rejected claims 5 and 20 under 35 U.S.C. 103(a) as being unpatentable over Chen (U.S. Patent No. 5,982,092) in view of Umemoto et al. (U.S. Patent No. 6,366,409 B1) as applied to claims 1 and 17 respectively above, and further in view of Gasparaitis et al. (U.S. Patent No. 4,644,925). The Examiner stated:

Neither in combination nor individually Chen (U.S. Patent No. 5,982,092) and Umemoto et al. (U.S. Patent No. 6,366,409 B1) teaches a lighting system for display the reflective layer including phosphorescent coating on its substrate.

On the other hand, Gasparaitis discloses a liquid display assembly 80 (Figure 4, column 3, line 60) comprising a phosphorescent coating 50 on the substrate 82 (Figure 3, column 4, lines 56-59).

It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify lighting system of Chen in view of Umemoto by providing a phosphorescent coated substrate as taught by Gasparaitis for the benefits and advantage of providing a display system with a supplemental lighting source for even distribution of light intensity.

Further, in section 4 of the Office Action, the Examiner rejected claim 21 under 35 U.S.C. 103(a) as being unpatentable over Chen (U.S. Patent No. 5,982,092) in view of Umemoto et al. (U.S. Patent No. 6,366,409 B1) as applied to claim 20 above, and further in view of Takauchi (Japanese Patent No. JP 06-172665). The Examiner stated:

Neither in combination nor individually Chen (U.S. Patent No. 5,982,092) in view of Umemoto et al. (U.S. Patent No. 6,366,409 B1) teaches a lighting system for display the reflective layer including phosphorescent coating together with metallized coating on its substrate.

On the other hand, Takauchi (Japanese Patent No. JP 06-172665) discloses a binder resin for an electroluminescent

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lamp (EL) comprising a metallized phosphor sc nt material applied on a transparent substrate 4 (Figure 1, English translated abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify lighting system of Chen in view Umemoto by providing a metallized phosphorescent material coated substrate as taught by Takaeuchi for the benefits and advantage of providing a substrate coating having resistance to scratching abrasion, chemicals and stains.

Further still, the Examiner rejected claim 23 under 35 U.S.C. 103(a) as being unpatentable over Chen (U.S. Patent No. 5,982,092) in view of Umemoto et al. (U.S. Patent No. 6,366,409 B1) as applied to claim 22 above, and further in view of Toray (Japanese Patent No. JP2000-138095 A). The Examiner stated:

Neither in combination nor individually Chen (U.S. Patent No. 5,982,092) and Umemoto et al. (U.S. Patent No. 6,366,409 B1) teaches a lighting system for display the reflective layer including fluorescent coating together with metallized coating on its substrate.

On the other hand, Toray (Japanese Patent No. JP2000-138095 A) discloses a light emitting element for a flat panel display comprising a metallized fluorescent material emitting light, and being arranged between electrodes (Figures 1-3 and English translated abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify lighting system of Chen in view Umemoto by providing a metallized fluorescent material coated substrate as taught by Toray for the benefits and advantage of providing a substrate coating having resistance to scratching abrasion, chemicals and stains.

With regard to independent claim 1, independent claim 1 as amended, recites "a reflective layer having phosphorescent coatings on a substrate, the phosphorescent coated surface reflecting the invisible light from the light source and converting the invisible light into visible light visible to the human eye." As stated by the Examiner in section 3 of the Office Action, neither in combination nor individually does Chen and

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Umemoto et al. teach a lighting system for display having a reflective layer that includes phosphorescent coating on its substrate. The Examiner asserts that Gasparaitis discloses a liquid assembly 80 comprising a phosphorescent coating 50 on the substrate 82. However, the phosphorescent coating of Gasparaitis is not a part of the reflective layer. Gasparaitis discloses only a phosphorescent layer which overlays a supplemental light source 82 and as stated "is positioned beneath phosphorescent assembly 48." Col. 3, lines 64-66. "The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." In re Laskowski, 10 U.S.P.Q.2d 1397, 1398 (Fed. Cir. 1989). Chen, Umemoto and/or Gasparaitis do not provide any desirability to combine the phosphorescent layer and the reflective layer. Further, the omission of an element and retention of its function is an indicia of unobviousness. In re Edge, 359 F.2d 896, 149 U.S.P.Q. 556 (C.C.P.A. 1966). The omission of a separate reflective layer is thus an indicia of unobviousness of the claimed invention. Accordingly, there is no motivation or suggestion to combine the invisible light converting system which is incorporated into the reflective layer recited in claim 1 in any of Chen, Umemoto and/or Gasparaitis. Accordingly, independent claim 1 and its respective dependent claims are allowable.

With regard to independent claim 10, Independent claim 10 recites "a method of producing an image on a display." The method includes "distributing the invisible light over the surface of a reflective layer, the reflective layer including at least one of a phosphorescent and a fluorescent surface." As described above, no combination of Chen, Umemoto and/or Gasparaitis disclose, suggest, or provide any motivation for distributing invisible light over a surface of a reflective layer where the reflective layer includes at least one of a phosphorescent and a fluorescent surface. Chen recites only a light reflection layer 30 that is separate from fluorescent pigment layer 50. Applicants have disclosed and claimed a configuration in which the reflective layer and the invisible light converting layer are a single layer and two layers are not required. Accordingly, neither Chen et al. nor Umemoto et al. disclose, suggest, or provide any motivation for the method recited in

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independent claim 10. Accordingly, independent claim 10 and its respective dependent claims are allowable.

Independent claim 17 recites "a display system" that comprises "a light converter, converting the invisible light to light having a wavelength visible to the human eye, the light converter having metallized coatings on a substrate to reflect visible and invisible light, and the light converter having phosphorescent coatings on the substrate." Accordingly, independent claim 17 includes limitations recited in previous dependent claim 21 that is now cancelled. Regarding claim 21, the Examiner indicated that Takaeuchi discloses a binder resin for an electroluminescent lamp (EL) comprising a metallized phosphorescent material applied on a transparent substrate 4." Most if not all inventions arise from a combination of old elements. See In re Rouffet, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457 (Fed. Cir. 1998). Thus, every element of a claimed invention may often be found in the prior art. See id. However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. See id. Rather, to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant. See In re Dance, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998); In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). There is, thus, no suggestion or motivation to combine the teachings of Takaeuchi for a metallized coating into the display which utilizes invisible light to provide visible light to an LCD element. Takaeuchi, Umemoto and/or Gasparaitis do not provide any desirability of making the combination. Accordingly, independent claim 17 for all the reasons given above with respect to independent claim 1 and 10 as well as the reasons regarding Takaeuchi are allowable. Further, claims dependent on claim 17 are also allowable.

\* \* \*

After amending the claims as set forth above, claims 1-4, 6-19, 22, and 24-27 are now pending in this application.

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Applicant believes that the present application is now in condition for allowance.  
Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

Date January 03, 2003

By



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**MARKED UP VERSION SHOWING CHANGES MADE**

Below are the marked up amended claim(s):

1. (Once Amended) A lighting system for a display, comprising:
  - a light source providing invisible light having a wavelength in a spectrum not visible to the human eye;
  - a reflective layer having [at least one of a phosphorescent and a fluorescent] phosphorescent coatings in a substrate, the phosphorescent coated surface reflecting the invisible light from the light source and converting the invisible light into visible light visible to the human eye; and
  - a display layer in which pixels of the display layer may be altered by applying an electrical charge to the display layer in a controlled manner, the display layer being illuminated by the visible light from the reflective layer.
17. (Once Amended) A display system, comprising:
  - a light source providing invisible light having a wavelength in a spectrum not visible to the human eye;
  - a light guide, dispersing the invisible light over a defined region;
  - a light converter, converting the invisible light to light having a wavelength visible to the human eye, the light converter having metallized coatings on a substrate to reflect visible and invisible light, and the light converter having phosphorescent coatings on the substrate; and
  - a liquid crystal display layer receiving and transmitting the visible light.

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